

Answers!

DIRECTIONS: For #1-8, solve for the variables as directed. Show work. Write your answers in the provided blanks.

1. If y varies directly as x , and $y = 63$ when $x = 9$, find y when $x = 5$.

$$y = 35$$

2. If t varies directly as $w + 2$, and $t = 24$ when $w = 14$, find w when $t = 57$.

$$w = 36$$

3. If a varies directly as b , and $a = 42$ when $b = 35$, find a when $b = 28$.

$$a = 33.6$$

4. If m varies inversely as the cube of n , and $m = 10$ when $n = 4$, find n when $m = 80$.

$$n = 2$$

5. If x is jointly proportional to y and z , and $x = 140$ when $y = 7$ and $z = 4$, find y when $x = 630$ and $z = 6$.

$$y = 21$$

6. If b varies jointly as c and d , and inversely as a , and if $b = 30$ when $c = 10$, $d = 2$, and $a = 6$, what is the value of b when $c = 14$, $d = 6$, and $a = 4$?

$$b = 189$$

7. Suppose w varies jointly as x and y and inversely as z , and $w = 22$ when $x = 4$, $y = 6$, and $z = 12$. Find x when $w = 66$, $y = 10$, and $z = 15$.

$$x = 9$$

8. Suppose m varies jointly as n and p^2 and inversely as the square root of q , and $m = 324$ when $n = 8$, $p = 9$, and $q = 36$. Find m when $n = 8$, $p = 5$, and $q = 100$.

$$m = 60$$

DIRECTIONS: For #9-15, answer the following word problems. Show work and use appropriate labels with your answers. Write your answers in the provided blanks.

9. A spring extends or compresses in direct proportion to the mass being supported. If a spring extends 30 cm when supporting 75 grams, how far will it extend when supporting 48 grams?

$$19.2 \text{ cm}$$

10. The monthly cost for Bryce to maintain 5 taxis has been \$714.80. Assuming the same rate, what will be the monthly cost if Bryce adds 4 more taxis to his company?

$$\$1286.64 \text{ (he now has 9 taxis)}$$

11. A survey showed that 99 out of 176 people questioned preferred waffles to pancakes. In a city population of 1696, how many people are likely to prefer waffles?

$$954 \text{ people prefer waffles}$$

12. The intensity of light (measured in watts per square meter - W/m^2) from a light bulb varies inversely as the square of the distance from the bulb. If the intensity from a certain bulb is $90 W/m^2$ when the distance is 5 m, what will be the intensity at a distance of 3 m?

250 W/m^2

13. The stopping distance of a car after the brakes are applied varies directly as the square of the speed of the car at the moment the brakes are applied. If a car traveling 60 mph can stop in 200 feet, how many feet will it take the same car to stop when it is traveling 90 mph?

450 feet

14. The number of kilowatt-hours (kWh) per year that an appliance uses varies jointly as the number of watts the appliance consumes and the number of hours per day it is used. A hair dryer that consumes 1200 watts and is used $1/4$ hour each day uses 109.5 kWh per year. How many kilowatt-hours (kWh) does a 100-watt light bulb use each year if it is turned on for 2 hours each day?

73 kWh

15. The volume a given mass of gas varies directly as the temperature and inversely as the pressure (Boyle's law). If the volume of a certain gas is $231 cm^3$ when the temperature is $42^\circ C$ and the pressure is $20 kg/cm^2$, then what is the volume of the gas when the temperature is $30^\circ C$ and the pressure is $15 kg/cm^2$?

220 cm^3